

AVIATION

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One of the Curtiss Carrier Pigeon Mail Planes of the N.A.T.

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XXII

SPECIAL FEATURES

NUMBER
11

A BRIGHT OUTLOOK
CURTISS BUILDS NEW NAVY FIGHTER
ROHRBACH METAL AIRCRAFT CONSTRUCTION

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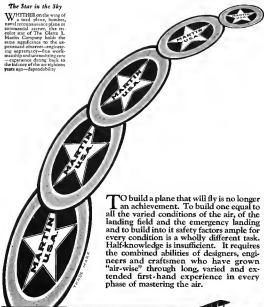
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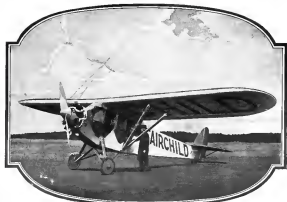
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With the Editor

In the production of modern aviation almost there is, with little doubt, no sphere which demands more skilled engineering work than the design of single-engine fighters or pursuit planes. In the first place, not only is the user "maximum" of performance percentage, but all of the many operations necessary in plotting, maneuvering, and surviving on the various functions of the machine have to be performed by one man. Furthermore such a plane is of necessity extremely small so that space is at a premium and consequently it is essential. Yet, as the other hand, resistance must be reduced as possible. If the fighter is to be a shipboard plane for service with the fleet at sea, these already complicated problems are by no means simplified by the fact that, together with a high performance, the machine must be versatile with some means for stabilizing the landing run upon alighting on the deck of the aircraft carrier.

Several of our leading aircraft manufacturers are now engaged in producing machines to meet these and many other demands. How one prominent manufacturer has satisfied the requirements with marked success is outlined in this issue of *AVIATION*.



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The newest most important changes in commercial aircraft built during 1923-25 were powered with Wright "Whirlwind" engines

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Vol. XXII

MARCH 14, 1927

No. 11

The Fuselage As a Gasoline Tank

IT IS among the standard practices in airplane design, particularly in the production of military aircraft, to place the gasoline tank in the fuselage ahead of the occupants and separating them from the engine. This arrangement, while having many advantages, often entails considerable complications in fitting and, especially in light machines, is quite a costly proposition. In the case of the old wood and wire construction of fuselage, and also in the more modern steel tube fuselage, it is difficult to overcome these structural and weight problems. But with the growing tendency to adopt duralumin in an increasing degree, the idea of incorporating the gasoline tank as an integral part of the structure appears to be a very feasible one. If, for example, a duralumin monocoque fuselage were constructed, there would seem no reason why the forward section of such a fuselage could not be made gasoline tight and be divided off with bulkheads to form a normal gasoline tank. Such an arrangement would have many advantages in view of the fact that the monocoque type of construction, while being extremely light, especially when carried out in duralumin, is at the same time extremely strong and the material would provide ample thickness, and, therefore, strength, for the fuel reservoir. Furthermore, weight would be reduced to a minimum in view of the fact that the gasoline tank, at such, would be contributing materially to the constructional rigidity and strength of the entire fuselage.

The question of making the forward section of a monocoque fuselage gasoline proof is, in fact, an already solved problem. Several manufacturers have produced wing engine nacelles of riveted duralumin, in which are housed reservoirs for oil and gasoline, and enough riveted duralumin gasoline tanks have been made to permit the reduction in the type of construction. It appears probable that the overall expense would be reduced and there is no doubt that, from the maintenance standpoint, the suggested has many advantages. In view of the fact that, presumably, the gasoline tank would last as long as the fuselage and it is difficult to construct of any better proposition in this regard.

It would be easy to enumerate many other advantages of what may be termed the integral construction of fuselage and gasoline tank. From the safety standpoint, the fuselage tank would probably have advantages over most present-day installations, alone. If, for example, any leak developed in either the fuselage or the tubular fuel containers, these would surely spill gasoline out into the open where the leak would be readily detected and there would be no danger of small pools of gasoline collecting on the inside of the fuselage. In the event

of crashing, the oil tank, which would be placed forward of the gasoline tank, would serve as a very effective fire wall. The gasoline and oil lines, which are the parts most likely to become defective, would be cranked and, therefore, easily inspected and repaired.

While there might possibly be structural objections to this proposition, a forced precedent in this connection already exists in many forms of duralumin construction, such as the engine nacelle, in which reference has already been made.

Selling Aviation

THIS PROBLEM of merchandising and salesmanship, as has been pointed out before in these columns, are serious and standardized, as a result of experience, in all spheres. Every good salesman, however, picks out and develops himself in the essential attributes and high spots of his own particular subject and endeavor to bring these before his prospects in the most advantageous and attractive manner.

In the case of aviation, as also in the case of the automobile field, one of the essential activities of a salesman is to arrange the subject matter for a demonstration. It is just here that the problems of the aircraft salesman begin. He cannot, as in the automobile business, drive his product to a prospect's door, but must first provide sufficient attraction for his prospective customer to visit the neighboring flying field. It is not unlikely that this very first step, and probably does, prove one of the hardest problems to be overcome in merchandising private ownership airplanes. Even in the automobile field, in spite of the fact that private cars are so common, it is invariably only after he has been given a ride, either by a friend or in a demonstration car that a prospect actually becomes a prospect by beginning to feel that he, too, would like to own an automobile.

The problem, then, is one of finding a means whereby a salesman may effectively induce his prospect to visit a flying field, and there is probably no other individual agent which can best be applied to overcoming this problem than the portable moving-picture camera. Moving pictures have already been used very extensively in merchandising, but because of the unequalled and unequalled aspects of flying from the aerial standpoint, the moving picture camera should play a very important part in the aircraft salesman's activities. In no other way can he place directly before the eyes of his prospective customer the uses and advantages which can be derived from private airplane ownership. Although it may involve a small investment, it would appear to be one well worth while.

Curtiss Builds New Navy Fighter

The FTC-1 Single-Seater Shipboard Fighter With the Air-Cooled Engine is a Striking Example of the Refinements of Modern Aeronautical Engineering.

THE CURTISS FTC-1 is a single-seat shipboard fighter, designed for the U.S. Navy. It is a tractor biplane, powered with the Pratt and Whitney Wasp, and its appearance retains many features of the highly successful Army Curtiss Hawk F1 and F3, and Fokker C1 machines.

Probably the most interesting feature of the FTC-1 is the landing gear, incorporating, for the first time in any airplane, hydraulic shock absorbers and oleo shock absorbers, wholly within the landing wheels. The shock absorbing medium is a non-flammable two-cylinder oleo and rubber disc type, providing smooth and easy action with no tendency to rebound. The wheel is of the disc type, with the hydraulically operated brake shoes located on the inner surface of the wheel rim. It is expected that the wheel brakes will be particularly valuable in making shipboard landings, as well as in improving the landing qualities when operating on land. Another new feature is the use, for the first time, of an oleo-disc tail skid. On other airplanes equipped with oleo landing gear, the entrepreneur has been unable to find the bearing action of the wheels has been discarded, the bouncing of the tail skid has been two more apparent. The oleo disc skid stabilizes this condition.

The airplane can also be equipped as a single seat airplane for ordinary water operation. The first and in the replacement version of the FTC-1 depicts borrowed from naval aviation practice, having a rubber strip runner Vee-bottom forward of the wing. It is expected in these improved take-off, landing and landing characteristics. The machine can be equipped with other types of landing gear, a new feature in fighting planes.

The fuselage of the FTC-1 is a combination of duralumin and steel tubing, with steel fittings, and, as noted above, is designed to take abrupt and de-landing loads. By the use of all this structure the Curtiss engineer has been able to produce a fuselage that compares favorably in weight with the standard Hawk fuselage, in spite of the heavier loads. The riveted diaphragm construction presents a great advantage over welded steel in the matter of field repair. With ordinary tools such as a bedvice, hammer, file, and screwdriver, it is possible to remove and replace a damaged member in the field, a thing which is impossible with welded steel fuselages. The detachable engine mount uses a steel tubular ring and struts. The small Navy equipment for making deck landings, is, of course, standard.

In order to obtain the maximum possible forward vision which is a prerequisite on a shipboard plane, it was necessary to provide some means of adjustment on the pilot's and With the aid in the following position, it was found that the pilot would be unable to raise the rubber pedals. To overcome this difficulty, an ingenious arrangement has been provided whereby the pedals operate on slides, and automatically move back in the seat and is raised. In addition, the pedals are

independently adjusted to suit the individual pilot, by means of a hand lever. On spring into the cockpit, standing in the pilot's position, the pedals to suit himself, and then when the pilot desires to remain constant he neither wants the position of the seat. Small secondary pedals control the action of the wheel brakes. All controls, including guns and bomb releases, are easily operated with the feet in any position. The cockpit floor is provided with a glass window as an aid to vision.

In the standard tailhook, just aft of the pilot's head, is provided a small compartment which opens by a pull of a cable, and carries a penetrable life raft, to be used in case of difficulty at sea. The raft can be inflated in a few seconds with carbon dioxide gas, a bottle of which, in liquid form, is carried in the same compartment. This marks the first time that this equipment has been provided on a fighting plane.

The overall weight of the Pratt and Whitney Wasp six-cylinder engine, at 400 hp. It drives a Curtiss-Rod radial propeller of the new forged type.

To minimize, as far as possible, the fire-risk, the fuel tank has been provided with a large dump valve. In an emergency the pilot can open this valve and drain all the fuel within a few seconds.

This dump-valve presents an advantage over the ordinary dump valve in that its satisfactory operation can be easily tested at regular intervals. Furthermore, if used in an emergency, it does not dump or expose the plane in any way, while the release of a dump valve of some type means that the airplane is out of service until a new tank is fitted. Additional safety is provided by dumping all fuel going out of the pilot's cockpit, and by a pressure type of fuel extinguisher carried in the engine compartment.

Throughout the plane, particular attention has been paid to accessibility and easy maintenance. All covering is quickly detachable in small sections, employing a new hook type of fastener which can be released with a quarter-turn of a screw driver. Top and bottom covering on the fuselage can be quickly removed for inspection of fuselage members and controls. All moving parts are provided with minute connections to insure proper and easy lubrication. As required, fuel lines, containing all necessary locks, starting switch, big tank, and a fuel-air kit, are conveniently located on the side of the fuselage.

The wings are of typical Curtiss construction, with square back lines and ribs. The wing curve conformed to the C-75, a new airfoil developed in the Curtiss wind tunnel. The wing arrangement combines pronounced forward stagger with even degrees of sweepback in the upper wing. The cut-out required in the upper wing for good vision in the usual fighting attitude decreases the efficiency of the wing to a marked degree. In the FTC-1, perfect vision is attained with no sacrifice of aerodynamic efficiency. Furthermore, and this point is of great importance in shipboard service, the sweepback pro-



The new Curtiss Navy Fighter FTC-1 equipped with the Pratt & Whitney Wasp engine which develops 400 hp.

vides needed stability and controllability at landing angles. Single bay landing, with streamlines and tube struts and streamline wires, is employed.

The streamlines are of a new balanced type which compensates against yaw and reduces the rubber movement necessary in turns. Tail surfaces are in ground similar to the Hawk, with a balanced rudder and non-balanced elevators. Carefully designed control in the control linkage eliminate any static in the controls.

It is interesting to note that the construction of the FTC-1 was started on Dec. 8, and the first flight test was made on Feb. 25—less than twelve weeks later. When one considers the advanced nature of the design and the many entirely new features it incorporates, this is an accomplished feat in itself.

While official performance information is not available, the preliminary flight tests have demonstrated that the FTC-1

is, with little doubt, the finest six-cylinder plane in existence. In the air, the plane displayed the excellent maneuverability qualities which are characteristic of Curtiss fighting planes, and, in addition, demonstrated its remarkable stability and controllability in stalling speeds. The slow landing gear functioned smoothly, and the wheel brakes provided excellent ground maneuverability.

At the conclusion of the tests at Wright Field the FTC-1 will be flown to the Naval Air Station at Annapolis for further tests, including actual shipboard operations.

The FTC-1 is one of three new fighters being developed for the Navy, both the Boeing Airplane Company and the Eberhart Airplane and Engine Company also producing new Navy fighters which will soon be ready for test. That all three planes will represent the very best work in aerodynamic design thus far is no doubt and the performance figures, when these are made available, will be valued with interest.



Another view of the Curtiss Navy Fighter FTC-1. Wing structure. Note the sweepback in the upper wing.

from the bottom of the fuselage to a point about half way out on each side of the wing to take most of the lift loads. The wings are of constant chord except for rounded tips which are decidedly raised towards the trailing edge. The streamers are stout in the root and are long and narrow. The entire wing structure follows normal biplane principles.

The fuselage is rather narrow for its length. The widest section is in the nose and, as it is a vertical section and the pilot sits above it, his visibility should be excellent. It should also be noted that the two axle support struts are forward of the pilot's seat and there is no overlapping of ship struts.

The cabin is 16 ft. 1 in. long, 5 ft. 7 in. wide and 5 ft. 9 in. high. There are five seats, most of which has a window which can be opened by turning a small handle on an aluminum plate. The exit door and the toilet are on the side of the cabin. The baggage compartment is just behind the passengers' cabin. It has two doors, one from the passengers' cabin and one very large door on the side of the fuselage.

The wing structure, as mentioned, are well streamlined into the wing surface and, as it will be seen from the pictures, all radii are out of the reference type. The modulus is supplied by springs. The leading gear track is over the fuselage and the main gear struts are half inch which extend out from the fuselage and which are known by struts extending vertically down from the wings behind the shock absorber. The tail wheel is set, relative to the chord, thus is usual.

The general details are:

Length	16 ft. 1 in.
Wing span	25 ft. 7 in.
Wing chord	5 ft. 7 in.
Wing area	145 sq. ft.
Wing load	17.5 lb./sq. ft.
Wing tip	17.5 lb./sq. ft.
Wing tip	17.5 lb./sq. ft.
Wing tip	17.5 lb./sq. ft.

The figures supplied are performance data for the cruising speed of 80 m.p.h., that the greatest thrust is 122 m.p.h., which is the best speed of 1,000 ft. in 25 sec. This may be a hypothetical error but the 3.31 W. engine is super-compressed at ground level and their full power cannot be developed until they reach a considerable altitude. If this fact were taken into account in the propeller design a plane could be made to fly faster at altitudes than at ground level and it might have been thought while in prospecting this feature in the design of the Holand. The ceiling of the Holand is 15,000 ft.

The Holand Holand recently set up some World land engine records. Carrying a payload of 4,000 lb. the maximum speed of the plane was 175.8 m.p.h., or approximately 167.5 m.p.h. and the average speed over a distance of 900 ft. (150 m.p.h.) was 165 km p.h. or about 105 m.p.h. On the same flight an endurance record was set up for the land carrying capacity, of 14 hr. 55 min.

The Holand No. 12, another machine manufactured by the Holand Company is a single-engine fighter with a 400 hp. B.M.W. V1 engine. This plane is built along the same general lines as all the other Holand aircraft. The leading edge of the wing is set in a space by means of a coil spring which is attached inside the telescopic struts. The plane is a high wing monoplane type and the wings, which are semi-rigid structures, are lower section left halves by heavy cables. It is said that the factor of safety is 1.5 at full load.

Boeing Prepares for Air Mail Service

The Boeing-Bellanca group, which was awarded recently the contract for air mail operation on the Western Division of the Trans-Continental route, extending from Chicago to San Francisco, is making active preparations to start operations. No less, plans include the construction of twenty-five specially designed mail and passenger carrying airplanes, which have a payload capacity of 4,000 lb., or more 1,500 lb. will be taken up with mail and express matter and the remainder in the cargo of two passengers.

The planes will be as designed that, in order to require, it will be possible to carry both passengers and, accordingly, reduce the need to a capacity of 1,500 lb. The planes, all of which, are equipped for night flying, both the pilot's cockpit and the passenger cabin being heated from the engine exhaust. These airplanes will be equipped with 400 hp. Pratt & Whitney Model W-18 radial engines powered with electric main starters. It is expected that a maximum speed of 180 m.p.h. will be attained with a cruising speed of approximately 160 m.p.h.

The airplanes will have steel tube fuselage construction, fabric covered, with the wings of wood and fabric. Wheel landing will be provided on the undercarriage, together with cable shock absorbers. No further details are at present available but the new members will be described in detail at a later date.

The Corrosion of Magnesium

The Corrosion of Magnesium and of the Magnesium-Aluminum alloys containing Magnesium from the subject of N. A. C. A. Report No. 248, which has been prepared after extensive study by J. A. Ryan, of the American Magnesium Corp.

The corrosion of pure magnesium is quite high. On magnesium an acid metal the metal corrodes with the formation of hydrogen and the film of corrosion product leaves the potential in a critical value. When the potential reaches this value, it no longer counts the theoretical hydrogen potential plus the overvoltage of the metal. Rapid corrosion consequently ensues. When aluminum is added, especially when in large amounts, the corrosion is decreased and hydrogen gases set at a much lower potential than with pure magnesium. The addition of a small amount of magnesium causes the overvoltage to be probably that of pure metal, and the film is again protective.

This report may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

De Pinedo's Flight Progress

Genaro Francisco de Pinedo, the Italian flyer, who left Port St. Paul, Brazil, Feb. 24, reached Pernambuco the same day. He left for Lima, Brazil, at 11:30 a.m. Feb. 25, arriving there in the afternoon. The distance between Pernambuco and Lima is 440 miles.

From Lima Genaro de Pinedo flew to Rio de Janeiro, then to Brasilia, completing the first stage of his trans-continental flight from Italy. On March 7, he will start on the second stage of his flight, which will take him from Brasilia to Rio de Janeiro, then to Recife, Pernambuco, the Dutch West Indies, Cuba, New Orleans, and other American cities, with New York as the object of this stage of his flight.



The new Travel Air (Whitcomb engine) plane in service with the Alaska Airlines. Alaska Airlines (left) and Jack L. Lusk (right).

Travel Air Planes for Alaska

The two Travel Air planes, ordered by the Anchorage Air Transport Corp., of Anchorage, Alaska, left Seattle, Wash., Feb. 14, by air for Seattle, Wash., from where they were shipped to their destination Feb. 18, arriving there on the 20th. Alaska Airlines, who made the trip to the first of Alaska in Alaska, to make the delivery of the planes, and Jack Lusk, pilot of the mission, and will not be paid for the service.

One of the planes is a cabin job, seating four passengers, beside the pilot and the other is a standard three-place, open type Travel Air. Both are powered with Wright Wheland engines and will have champagne landing gear—shock absorbers, as well. A third Travel Air plane has been ordered by the Anchorage Company, the type of which will be described upon arrival of the first two planes.

The planes will be placed primarily in commercial development carrying and photographic work, as well as in the transportation of mail and freight. The delivery of the country in which they will operate, and the type of vehicles, which are used for a variety of uses to which they plan to be put. Travel to the service of the country, where planes and fish stored, as in the fish, which is also transported. The two planes will, therefore, be employed at the first of the Alaska Airlines.

Travel to transport freight and fishing parties, as well as to transport and goods during the winter season, when most of the planes are high. They will also serve as mail and have the mail delivered and act as emergency transports for doctors or people who have fallen ill in isolated districts. Other activities will be the location of fishing trawlers lost or disabled, or which have been wrecked from storms, locating and reporting cables of sailors in traps and carrying passengers and baggage between cities in Alaska and Seattle.

It is the expectation of Anchorage officials that the service will grow to such an extent that within a year or two there will be sixteen planes will be needed.

Aviation Medicine Course at Georgetown

A course of six lectures in aviation medicine was started Feb. 3, at the Georgetown University Medical School, Washington, D. C. The course has been undertaken with the cooperation of the Department of Commerce.

Georgetown University is the first medical school in the country to include such a course in its curriculum. The lectures will be given by Dr. Lewis H. Brown, Medical Director of the Aeronautical Branch, Department of Commerce.



Genaro Francisco de Pinedo, the Italian flyer, who left Port St. Paul, Brazil, Feb. 24, reached Pernambuco the same day. He left for Lima, Brazil, at 11:30 a.m. Feb. 25, arriving there in the afternoon. The distance between Pernambuco and Lima is 440 miles.



Genaro de Pinedo's Savoia aircraft. Genaro, standing in front of his plane, is at the start of his proposed long flight, the first stage of which is now completed.

PICTURES | THE NEWS



RETURNING IN THE MAIL.—A Curtiss Carrier Pigeon (Liberty) mail plane of the National Air Transport arriving at Kansas City with mail from Chicago.—The plane is C.A.M. No. 4.



F. & A. Photo

ILLUMINATION.—Flying to night from America, Naval Air Station, great 50 billion candle power of the B-10, in late war air load high assembly recalled. Lane, George H. C. Work at command of the station at airplane to take off in a Yeakle.

RECORD SPAIN.—A (military) stream, record plane of the Spanish air force. No further details of the plane set given through in last week's Public Opinion about it.



F. & A. Photo

50 INCH.—A line up of Navy TB plane (Night Whirlwind) on the deck of the aircraft carrier, U.S.S. Langley. The boats on the undercarriage taken of the planes and of lessons in representing part of the aircraft mechanic, full information to which has never been published.



Unknown Photo



Unknown Photo

MAKING FOR LAND IN A HURRY.—(Landing) 100 by parachute over San Diego Naval Air Station.—The parachute had apparently not started to open when the picture was taken.

FOR HYPERMILITARY USE.—The French Brown submachine plane, which is equipped with a 100 hp. Hispano engine. The machine is built in to the main body in a few minutes, wings and tail folding up the fuselage when the plane is in flight.



Robert Photo

these are reversed. Therefore, instead of slowing free movement as a vertical plane, the best method is to keep the ship as near horizontal as possible. There are four means available for doing this: (1) Use of elevators, as a fair wind, (2) Quick shifting of ballast weights, or side and out of the ship, (3) Drugging down on the outrigger, (4) Positive ground connection for automatically holding the ship in or out of a horizontal position.

This latter method is the safest and can be applied with the ship on the ground. With the newer design, a flat spot on ground for stopping the ship should suffice, providing there are no ruts, ruts, ruts or other means for keeping the ship horizontal and permitting free movement. The regular ship or better off on the present type of ships a clearance from the ground that seems desirable during the process of mooring. It will accommodate ships of varied dimensions. It does not require a lot of dirt and permits obstruction below.

The most type of mooring means has obvious advantages as a mooring mooring base of use. The principle may also be used for a mooring tower on a tall building in the center of a city. Probably the most fundamental objection to such terminals in their form would be no direct connection with airplanes from mooring to other points.

The Ford tower at Dearborn, Mich. has, in addition to the regular mooring connections at the top, a grille roll by means of which the ship may be lowered to the ground, with the mooring the first mooring connection at the base. The Army tower, at Great Falls, which is almost completed, has no load-down mechanism, but represents a distinct advance in general construction.

Among the substitutes for post mooring in the use of direct contact by tender airplanes, which would permit the telescopic and discharge of land without the expense and delay involved in actual mooring. This method is analogous to the use of tenders for some mooring, except that the airplane would keep on its course without stopping. Several experiments have already been made in taking-on and releasing planes from tenders, but the method has not yet been perfected to the point of being one of it for commercial purposes.

Passenger will be suitable, of course, for shortening non-stop flights and express. Mechanical devices have been seriously proposed for taking on and releasing airplanes. The principle of a number mooring. Both of these possibilities, however, require the airplane to be moored over some predetermined spot.

A number of mooring methods with measure to a mast or tower is simple to design and easy to construct. A few have been tried in the air on the ground principle of a life buoy. With the suggested stability of the tower design, the method appears to be feasible at least as far as the present time is concerned. The best design in this case for the telescopic and discharge of passengers would be as a elevator, designed to travel up and down the mooring cable. It should be as great as possible, but not so large as to be a danger of specific danger and experience.

The mooring of airplanes close to the ground will minimize the need for landing, leaving hangars, but a certain amount of hangar for overhauled aircraft will always be necessary. Before the invention of the tower mooring, the problem of getting into a hangar in a side wind was serious. Because of this, most of the American hangars were situated on the water side and there were lands in the water. Recently constructed hangars at South Field and Lakehurst have been built in a fixed position but have doors at both ends. The hangar now under construction at Great Falls, Wash. has doors at one end only, the rest of the mooring tower, and the hangar is built in the shape of a wide track, which forms the head of a runway. The section one of the hangar is made large enough to accommodate a considerable number of airplanes at the same time, it being only necessary in this case to add to the length.

The important factor in hangar construction of present is to have adequate section side, taking into account the fact that the hangar will be used as a shelter and that the doors at the base of the post. Airplane should have outside mooring, if by no other reason than to provide means of temporarily holding the ship at a time when entrance in the hangar may be prevented by unfavorable weather.

Air Exports Show Increase

During the calendar year 1936 the value of United States exports of aircraft engines, aircraft and parts increased almost one-third over those of 1935. Specifically they increased \$58,575 over the 1935 total of \$76,029 and thus showed a reduction of over one million dollars in the year past. This is very encouraging in view of the number of sales made in Latin-America by European companies during the past year, American manufacturers finding their power very different to meet due to European currency depreciation.

In the following table is shown the United States exports of aircraft products for the past five years:

Year	Planes	Engines	Parts	Total
1936	26	3	17,440	17,469
1935	37	0	15,541	15,541
1934	24	0	10,440	10,440
1933	21	0	10,440	10,440
1932	21	0	10,440	10,440
1931	21	0	10,440	10,440
1930	21	0	10,440	10,440
1929	21	0	10,440	10,440
1928	21	0	10,440	10,440
1927	21	0	10,440	10,440
1926	21	0	10,440	10,440
1925	21	0	10,440	10,440
1924	21	0	10,440	10,440
1923	21	0	10,440	10,440
1922	21	0	10,440	10,440
1921	21	0	10,440	10,440
1920	21	0	10,440	10,440
1919	21	0	10,440	10,440
1918	21	0	10,440	10,440
1917	21	0	10,440	10,440
1916	21	0	10,440	10,440
1915	21	0	10,440	10,440
1914	21	0	10,440	10,440
1913	21	0	10,440	10,440
1912	21	0	10,440	10,440
1911	21	0	10,440	10,440
1910	21	0	10,440	10,440
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1722	21	0	10,440	10,440

The Northwest Airways

Col. L. H. Brittin, who was responsible for the development of St. Paul's airport, has to his credit also the establishment of the Northwest Airways. When the Ford Reliability Tour planes visited St. Paul, Colonel Brittin headed a delegation at the landing offices and took flights in a Stinson Detroiter plane of the Stinson Aircraft Corporation and inspected the facilities.

So his determination to start an airline, Colonel Brittin varied Detroit and made the proposal that fifty per cent of the money necessary to place the Northwest Airways in operation be raised in Detroit, and the remainder be furnished by St. Paul business men. He found the Detroit interests willing to cooperate on these lines.

The Stinson Air Service is now operating a line between Detroit and Grand Rapids, which is the first link in a line which will eventually run through St. Paul. It will connect Lake Michigan and connect with the Northwest Airways at Milwaukee.

While the financing was in progress, an order was placed with the Stinson Aircraft Corporation for Stinson planes, equipped with Wright Whirlwind engines. These planes are of the standard cabin type, heated by water flying, equipped with lexan on the wheels and land storage. This wood is used to insulate the cabins of these planes, because of the cold weather conditions which prevail in the Northwest. The planes are also equipped for night flying.

On Oct. 30, a fleet of three planes left Detroit and flew to Greenway to Chicago in 2 hr. 40 min., and from Chicago to Milwaukee in 50 min. The three planes were owned by the

Edward A. Stinson, president of the Stinson Aircraft Corporation, Capt. Raymond B. Collins, co-president of the United Trust Co., at Detroit, and Harold Bekuske, who piloted a plane. C. S. Welens, a pilot of the Northwest Airways, who made the trip, so did Frank W. Blair, president of the United Trust Co., Detroit, Harold H. Sweeney, William B. Reed, Col. L. H. Brittin, Carl E. Keller, William A. Metz, Rex B. Jackson and Frank E. Daguer.

At Milwaukee, a reception was held for the visitors. In spite of fog and snow, the planes left Milwaukee early Nov. 1 and visited St. Paul in the afternoon. Since that time, Stinson planes have been in regular service on the Northwest Airways run. One plane leaves Chicago at 8:30 a.m. and arrives in St. Paul at 10:40 a.m., making stops at Milwaukee

and La Crosse. In addition, planes leave Minneapolis at 12 p.m., St. Paul at 2:10 p.m., La Crosse at 3:30 p.m., Milwaukee at 5:25 p.m., and Chicago at 6:45 p.m.

It is planned to carry passengers on the line in conjunction with regular service in a short time. Passengers coming from the Pacific Coast on trans-continental lines may be taken off at St. Paul and travel to Chicago by plane in time to make connections with the Transcontinental Express Limited, the New York. Passengers traveling from New York to the Pacific Coast may leave the train at Chicago, take a plane to St. Paul, and there catch the trans-continental train which leaves Chicago on the previous night.

The officers of the Northwest Airways are: H. H. Sweeney, president; L. H. Brittin, vice-president and general manager; Frank W. Blair, treasurer and William B. Reed, secretary. The Board of Directors is composed of Detroit and St. Paul men.

On Feb. 1, David L. Bekuske, an mail pilot on the Northwest Airways, around the State of Wisconsin, a distance of 173 miles, in 75 min., at the rate of 2 1/2 m.p.m. For a portion of the distance he averaged 175 m.p.h.

Before starting into the cockpit at La Crosse, Wis., he wired the Milwaukee postoffice that he would arrive ahead of schedule time and asked that a mail truck meet him at the county airport. As his plane was waiting down on the field, the telegram was delivered.

The Stinson Detroiter plane, which made the record, has been in service several months, making flights daily. Handicraft propellers are used and 580 hp Wright Whirlwind engines.

New Airway Extension Superintendent

The appointment of Jack P. Worthington, of Washington, D. C. as airway extension superintendent, for the airways route from Chicago to St. Louis, has been announced by the Department of Commerce. Mr. Worthington is a lieutenant in the aerial reserve air service and a colonel of the World War.

There are now airway extension superintendents at the numerous airports of the Department of Commerce. The duties of the superintendents are to assign routes for planes when and to select intermediate landing fields. They are under the direction of P. C. Henshaw, of the U. S. Legislative Service, of the Department of Commerce.



A fleet of Stinson Detroiter aircrafts, which have been ordered by the Stinson Aircraft Corporation, are being used on the Northwest Airways.

Better finish in less time!

Two Aces Each the best finish of its Type

VALENTINE'S
VALSPAR
THE FINEST FINISH IN THE WORLD

VALSPAR is the famous waterproof varnish that "grew up" with the Aviation Industry.

In the short span of its years, Valspar has helped many a history-making plane to success—N. C.-9, the *Douglas Round-the-World Contender*, *Boyd's Immortal Fokker* and many others. Today Valspar is the most widely used airplane finish in the world.

This remarkable varnish gives a tough, durable, water- and weather-proof finish that adheres perfectly to wood, metal or wing-doped fabric. It is absolutely undamaged by water, grease, gasoline or oil and resists sunlight and temperature changes to a degree unequalled by any other varnish.



"Cly" Boyd's record-making Fokker Winner was Valsparred, of course.

NITRO-VALSPAR

NITRO-VALSPAR is the outgrowth of war time needs for a painting material combining great strength in application and extreme durability. As such material then existed, the Valentine Chemists tackled the problem and developed a material now called Nitro-Valspar, that completely met the needs of the Government.

Nitro-Valspar is recommended for use where spray-gun equipment is available. It produces a tough, wear-resisting film, thinner and lighter than Valspar, yet in every way its equal in durability. Repairs are easily made, for Nitro-Valspar is basically similar to wing-dope and amalgamates with it thoroughly.



Grand Patrick's own plane is finished with Nitro-Valspar in Yale Blue and Acromine.

Technical Consulting Service

Manufacturers and operating companies interested in solving their finishing problems are invited to consult the Valentine Technical Staff, who will gladly cooperate in working out a thoroughly satisfactory finishing system to meet individual requirements.

VALENTINE & COMPANY

Largest Manufacturers of High-Quality Varnishes in the World—Established 1876

New York—635 Fourth Ave.

Chicago—140 South Dearborn St.

Detroit—49 Parkman St.

Dallas—10-251 General Motors Building—Telephone Empire 3125

W. P. Fuller & Co., Pacific Coast

The Driggs Aircraft Corporation Formed

The Driggs Aircraft Corporation, of Lansing, Mich., was recently incorporated under the laws of Michigan, with a capital of \$200,000, to engage in the manufacture of airplanes. Irvin H. Driggs, formerly of Lansing, has for many years been associated with aviation activities in Detroit, has moved his plant to Lansing. Mr. Driggs is well known in the aircraft industry, having developed the Driggs Dart, the plane which flew over the Adirondack Mountains in the Pennsylvania Air Race and which also participated in the Reliability Tour last year.

The present production program of the new company calls for the construction of fifteen lightplanes of a type yet to be announced, for Spring and Summer delivery. The personnel will amount at about twenty men.

The officers of the Driggs Aircraft Corporation are: Harry F. Harper, president; Irvin H. Driggs, vice-president and general manager; E. C. Shadle, secretary and Hugo B. Lundberg, treasurer. The Board of Directors consists of the officers and R. E. Gish, Donald Bates, Ray Patten, J. T. Hoffman and H. T. Thomas.

Henry J. White Joins Sikorsky

Henry J. White, who for the past five years has been a member of the sales force of the Mack Truck Company, has joined the personnel of the Sikorsky Manufacturing Corp., of New York City, as sales manager. Mr. White is a pilot of many years standing. He joined the firm in 1921 on the first Sikorsky Wright airplane. In 1916, Mr. White graduated from the Naval Academy at Annapolis and served in the Navy during the War.

Due to Mr. White's wide experience, the Sikorsky Corporation is to be considerably aided in having secured the services of Mr. White.



Harry F. Harper, an assistant pilot of the Robertson Airways with the Sikorsky biplane in which he flew across the State of Wisconsin in twenty-five minutes.

Night Airway Opened, St. Louis-Chicago

The first midnight flight over the newly-lighted St. Louis-Chicago airway was made recently by Charles H. Lindbergh, chief pilot for the Robertson Aircraft Corporation.

It was 11:15 p. m. when Lindbergh's plane soared over broad Maywood Field at Chicago and sped away for the first two-hour business pointing the way toward St. Louis.

Through the red winter night above the 28-inch revolving electric light, and at the base of its 44-foot steel tower glowed a concrete arrow, its point toward Chicago.

Another light flashed as a flaring wind rose, the steady-like device that shows which way the wind is blowing, a familiar sight at all air fields.

Lindbergh saw that these things he saw from the air were the first results of several months of work and approximately \$40,000 spent by the Robertson Corporation in construction for the Government in constructing the route.

At two intervals on his trip there were swarms of light drawn the glowing machines shoot across fields. The pilot recognized the two intermediate landing fields that have been lighted. Seven more will be illuminated as soon as possible.

Although Lindbergh could not see them, over each house and landing field is a small building, 30 by 14 feet, housing the gasoline engine and electric generator furnishing the electricity for the aid.

The twenty-fourth lesson is north of Florissant and Lindbergh swung across it toward the home hangar at Lambert-St. Louis field at 12:30 a. m. next day. He had made the first flight over the lighted route in midwinter in the coldest time of 2 hours and 15 minutes, with the thermometer at the ground at 29° below.

Night flying is an new thing to Lindbergh or the other pilots for the Robertson Corporation. Every minute, when the air mail service left for Chicago, the dash has been to fall.

There must be an hour and a half of flying in growing darkness. But this flight was unique in being the first over the inland route, and made in the middle of the night.

A telegram to the Robertson Corporation notified them that the next plane from Chicago had been temporarily delayed because more to Chicago was delaying mail trucks on their way to Maywood field.

Captain Lindbergh, a chief instructor for the Robertson School of Aviation, which is owned and operated by the Robertson Aircraft Company. This school was founded in 1919 by Major Win. H. Robertson and Louis F. Pratt, H. Robertson, graduates of Army training schools. The instructors are air mail pilots and the training equipment consists of Stinson J.1's, De Havilland, equipped with 400 h. p. engines, and C-4 and Hawk Civils.

During 1926, seventeen students were graduated from this school. It is in operation all the year and students may enroll at any time.

Radio Beacon Experiments

The Bureau of Standards is making an experimental installation at College Park, Washington, D. C., of radio apparatus, for use in connection with the operation of aircraft over regular air routes. Three kinds of experimental work are being carried on, especially, in radio telephony from ground to aircraft, directive radio beacon, and a system of radio marker beacons. Several types of receiving sets are being studied in order to prepare specifications for a sample set for use on airplanes to receive both radio telephone messages and the beacon signal.

The beacons tested have been created and protection and equipment are being considered. Improvement in the beacon system has been carried out in the laboratory work. One of the improvements is expected to reduce the use of three beacon signals to the same working of a light on the airplane instrument board.

This marker beacons are small radio transmitters to be placed every twenty-five miles to act as substitutes to tell a pilot how far he has flown.

Specifications are being prepared for radio telephones and beacon installations at two points on certain air routes to supplement the experimental work being done at College Park.



Another Hard Job Accomplished OVER THE ANDES

THE non-stop flight of Major Dargus' Pan American Squadron from Chile across the continent of South America to the Argentine, exactly on schedule, with perfect functioning of equipment and covering 670 miles in five hours and forty minutes, is an achievement that stands against any odds, forever in their credit and that of their steady, dependable, hard working *Loening Amphibians*. Flying this hazardous journey at 13,000 feet over the Andes "which were completely obscured by storms and clouds, followed by severe buffeting from hot winds off the northern Patagonian Pampas", he and his gallant crew united the waters of the Pacific to the waters of the Atlantic in one of the World's Classic Flights—bringing new honors to the Army Air Corps, and to

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FOREIGN AERONAUTICAL NEWS NOTES

By Special Arrangement with the Automotive and Transportation Divisions,
Bureau of Foreign and Domestic Commerce

Air Way from Russia Abroad extended

The first contract has been made between the Aero A. G. and the Deutsche Luft-Hansa concerning air traffic and business from Hamburg-Berlin, and Hamburg-Moscow.

According to the agreement, the new company would handle the traffic between Hamburg and Berlin, where the Deutsche Luft-Hansa operates, in Moscow on the line Berlin-Lipsk-Moscow, but since the Airline in Lipsk will not be ready until the beginning of the summer, the traffic on this line cannot begin before the middle of June.

Departure from Hamburg will take place at 9 o'clock in the morning. From Lipsk the machines will depart at 9:30 a.m. and arrive in Berlin at 4:30 p.m. The plane will depart from Berlin at Moscow at the same time as the plane from Hamburg. The departure from Moscow is scheduled at 3:35 p.m. The departure from Moscow is scheduled at 3 o'clock in the morning and arrival in Hamburg at 9:45 p.m.

The traffic Hamburg-Berlin will commence on May 1, and a large plane will fly only twice between the two towns.

The air service between Hamburg and Berlin will begin as soon as the new conditions in the latter of Soviet period. The machines of the Aero Company are already in order, and as far as the use in the flying school of Stockholm is concerned, the company is also taking off the flying school. The traffic will begin in the middle of the month. The flight will be daily, including Sunday.

Considerable interest regarding air traffic with Russia is being manifested in Germany. The director of the A. B. Aero-transport, has said that expedition has been desired for some time to have a direct air connection between Sweden and Russia. If the flying route Hamburg-Berlin is extended through Finland over Petrograd to Moscow, it will mean that a journey from Stockholm to Moscow could be made in one day.

New African Commercial Airline

The Sabena, (Societe Anonyme Belge d'Exploitation de Navigation Aeronautique), the company which holds the exclusive franchise for the operation of mail aviation lines in the Belgium Group, has announced the establishment of a regular air service connecting Brussels, on the coast of the North Sea, with Kinshasa, in the far southeastern corner of the territory.

Weekly, three three-engine planes are used on the new service and the flights start from Brussels after the arrival of the Belgium mail steamer from Antwerp, every eight days. The time required for the trip from Brussels to Kinshasa, a distance of 1,200 miles, is two days. The entire distance is by air other routes, such as over the Congo and the Congo as far as Luanda, traveling overland from there, would require fifty days. Throughout the service there are intermediate landing fields every nine miles.

The several land trips from Brussels, for passengers and mail, over this service are approximately thirty-five cents per passenger mile, with the French rates varying considerably, according to the length of the trip. Outward fares are approximately twenty per cent lower than inward, and a five per cent reduction is made on the sum of the two fares for a round trip ticket. The journey is to be completed within a time actually agreed upon between the passenger and the company. The operation also offers to make reductions amounting to as much as ten per cent for contract work, either passengers or goods.

Sabena supplements this air service with a line of airplanes powered with Deau 300 horsepower engines, and driven by propellers, which work up and down the Congo and the Kasai, working at times and sometimes too small to be needed by plane. These machines are particularly designed for shallow waters, and will operate in as little as fifteen centimeters when carrying their full normal load of a ton and a half.

France Awards Prizes to Manufacturers

A recent of prizes established by the French Under-Secretary for Aviation since 1931 were distributed to several French firms at the place of the prize.

The sum of 10,000 francs was given to the Renault Company, manufacturers of airplanes, and the Hispano-Suiza Company, manufacturers of engines, for the second breaking new-day flight from Paris to Dakar (approximately 3,500 miles).

A prize of 10,000 francs was given to the Nord Company, manufacturers of the plane which established a new altitude record of seven-thousand feet. A prize of 15,000 francs was given to the Heinkel Company for the best compressor used in altitude flights.

Prizes established for speed records with airplanes and for emergency flights were not awarded, due to previous records remaining unbroken. In the case of the supersonic speed record, a French plane was not the winner.

Extension of German Air Traffic in 1937

German airlines have carried about 40,000 passengers and large quantities of freight and mail during 1936. The use of last year's experience has accelerated the extension of several new lines.

Service will be inaugurated between Sofia and Stuttgart, Berlin, Prague and Munich, and Glinville and Vienna. Another line from Prague to Vienna, to Berlin, to be put into service. A line from Cologne to Duisburg (Rhinort) and Rotterdam is to be operated with airplanes flying over the rest of the Rhine. Additional planes are to be put on the line between Berlin, Amsterdam and London. An increased service will be maintained between Munich, Milan and Rome. A three-month service is planned between Berlin, Götting and Oslo.

In the past half of the year a service from Germany through Basel, Direct, Mombasa and Barcelona to Madrid is planned.

German-French-Belgian Air Agreement

German air agreements with France and Belgium were notified by the Brinkman on Dec. 6, 1935, by which all conditions between the respective countries is regulated on the basis of reciprocity and along similar lines as the aerial agreements with other European countries. The only deviation of importance in the stipulation of the French and Belgian agreements whereby the inhibition and operation of regular air routes by an aerial company of the one party only, or even, the territory of the other is subject to a special agreement between the two contracting parties. Furthermore, there are additional rules from private civil airplanes, state-owned airplanes if used exclusively for commercial purposes.

Czechoslovakia-Germany-Austria Air Agreement

Agreement regarding air traffic on the Vienna-Prague-Berlin-Berlin-Copenhagen-Moscow route has been concluded between Czechoslovakia, Germany and Austria. The first plane left Vienna on March 7, in the morning, and reached Berlin in five hours for passengers to take the night train to Stockholm.



By ROBERT S. GIBSON

A short time ago the newspapers told of a photograph which had been taken from an airplane, in a mid-air collision, and had been telegraphed to New York within twenty minutes after it was exposed. This is a notable accomplishment, but the system cannot be said to be perfect until the New York telegraph newspaper can be reached back, with the picture furnished as the first page, before the local newspapers can get out an extra edition.

We are in a somewhat bad mood just now but you'll have to pardon us, as we have just finished reading G. G. Wells' article on aviation in the Sunday edition of a prominent New York newspaper. It is seriously disappointing to work and study as many years trying to get somewhere in "this air business," only to have Mr. Wells decide that aeronautics will never amount to anything. Guess we'll have to try to buy back the old firm in Jersey, otherwise the future there doesn't seem to be any brighter, now that Mr. Cockburn has stated any possibility of immediate future is nil. It is really, we are fairly, however—as should have mentioned Mr. Wells in the first place.

We are quite enthusiastic about the project, which has been approved by all of our national legislators, to place a monument on Kall Island (at Stockholm), G. G. Wells' article, the first successful power flight. This is certainly, an achievement of which all Americans should be proud, and an appropriate marker to dedicate the spot where it occurred should

be organized. The suggestion that Dec. 17 be set aside as "Aviation Day," leaves an odd and unaccounted, however. The crying need just now is not for new holidays, but for a reformation of the holidays now existing, so that they will be of some value to the citizenry. For instance, of what use are the holidays on Feb. 22 and 23 to the first land-sea man? They come too late for leaving or being, and too early for golf and tennis. All for us in a hole out the other from the office or home while trying to replace the groups down which blow off in the last hours. Christmas and Easter are almost a nuisance. Independence Day, Decoration Day, and Washington are the only real holidays we have. If some statement will come forward with a suggestion to make some "New Summer Day," set Aug. 30, a holiday, Aviation Day, in commemoration of the flight on Dec. 17, to make it one of our own for any office to which.

The Imperial Aviation museum in Berlin, Germany, in which some of the country's most was required by the war on the stage, of airplanes, and the process and machine involved in them. Our friend wanted to know if the airplane were used to provide the moon, moon, moon, that used to come from the late moon.

Subsidies for Austrian Airlines

In 1937, the Austrian Government will spend the sum of \$450,000 on the development of air traffic and \$450,000 on airplanes. It is expected that the bulk of this sum will be used to subsidize various airlines.

However, the Austrian Government has not granted any direct subsidies to airlines, contrary to the practice in many other European countries. The fact that the airlines in Austria are largely operated by foreign companies is probably a direct result of this policy, which has been desired of course, for the different financial conditions in Austria since the War.



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Columbia, S. C.

At the request of the Chamber of Commerce, of Columbia, S. C., Pope Field found country in the planning of a municipal airport for that city. Later, Milton M. Murphy and Herbert W. Gunkle flew down in a D-11 and inspected the proposed site. A consultation between the chamber officials and the 1st Air Corps division resulted in very definite plans being laid for a modern field.

Part of the State Park grounds is to be leveled, enlarged and cleared of trees which would affect the approach. Hangars for several planes will be provided.

Detroit, Mich.

The Aeronaut Club of this city, in its campaign to increase the use of the air mail, and to place Detroit on the transcontinental air mail line, has had most excellent results. In a talk over radio station WCK, Charles Kellogg, Detroit Postmaster, announced that the company has brought about a 300 per cent increase in air mail use out of Detroit. If other large cities could even approximate this record, the prospects for the air mail and air transportation lines in general would be highly promising.

Wright Field

Work on Wright Field, which was presented to the Government by the officers of Dayton, is progressing rapidly. According to Capt. E. M. George, engineer, Quartermaster Corps, U.S.A., who is in charge of construction, it will be done in four years before it is completely equipped, but it is thought that it will be in such shape that a portion will be ready for use by June 30.

Care is being taken with the 800 acre landing field, which is being graded, drained, tiled and sown with grass.

Aviation Progress in Northern Kansas

Aviation in Northern Kansas is all ready for the biggest year in its history, both in flying and sales of aircraft. The Central Aircraft Co., of Mahan, Kan., is opening out its first 1945 season, which is really no increase in a new and high performing line. They also have announced for pending orders for sale one-half mile West of town.

Dale Hagen stopped over to Kansas City, in his plane Stinson and gave the public an exhibition of quick pre-flight and rapid climb for a plane of this kind.

Memphis, Tenn.

By C. B. Apps

There has been quite a lot of flying in Memphis lately. On Sunday, Feb. 20, there were six planes at Post Field, all kept busy. They took up more time than thirty passengers in the morning.

Loren T. C. Oatis has two new students, which makes his excellent customer base.



March Field, Cal. to be Re-occupied

Within a short time March Field, at Pittsburg, Cal., will again become an assigned station in a world of two at the most important of the new Army projects, the Air Corps Emergency and the bombing program.

In order to provide housing for the new personnel which will be admitted to the Air Corps under the Emergency plan, existing facilities must be revised. Such bases which are provided at the Air Corps Training Schools near San Antonio, Tex. Furthermore, additional stations must be provided for the new units which will result from the expansion of the Air Corps. March Field has been selected as an off-base permanent station for Air Corps units and during the expansion of the Air Corps will be utilized as an additional training station.

March Field was named in honor of Lieut. Peyton C. March, Jr., Air Corps, U. S. A., who died while undergoing training

at Fort Worth, Tex. He was the son of Major Gen. Peyton C. March, former Chief of Staff of the Army.

The reservation accounts of the cost of civil and reconstructed terms. The main conditions are so favorable that during the new active flying was seldom interrupted on account of inclement weather at this field. However, with the reduction in the Army which followed the war, March Field was abandoned, except for maintenance.

Materials for the reconstruction of 800 isolated new and quarters for officers will be constructed. The new buildings will be of fireproof material and a type of construction suitable to that vicinity of California. Work on the new construction will commence early in next July and be completed in one or two months.

In the morning steps will be taken for re-occupation of the post. Col. William G. Ginterbach, Quartermaster Corps, has been ordered to take station at the field about March 15 for duty as Quartermaster and Constructing Quartermaster. About the same time a small detachment will be sent to the post, consisting of Quartermaster, Medical and Air Corps personnel. Early in June it is contemplated to send about 800 Air Corps personnel to the field for service with the primary flying school which will be organized for a capacity of 165 flying cadets and about forty officers.

Airport Marking

To encourage further the proper marking of airports throughout the United States, with the purpose of making their location by strange planes less difficult, orders were recently issued to all Air Corps stations to place in the center of the best landing area the conventional 300 ft. white circle with four foot bars. Hypothetical how these that circle, of sufficient large and effective suitable color contrast with surrounding terrain, can be seen by approaching pilots before any other method of identification, during daylight hours. When of light, green and olive markings placed within the circle are not recommended, since such characters distract

from the value of the circle as a marker and because a more suitable place for such characters is on the longer roof or along the sides of the airport at a convenient distance from the buildings. In colder climates where snow prevails for long periods it has been found that a circle swept clear of snow just outside of the white circle will afford a better color contrast with the snow than if the white circle were cleared.

The Army Air Corps has for some years painted its radio towers, mooring towers and other high constructions with alternate black and aluminum lacquered stripes, each sixty inches wide. While this color combination has been found very effective, experiments are being conducted with a third color (dark orange) which it is expected will give a greater contrast in fog or with a background of snow.

Recent Flight from Langley Field

The military TC-6, piloted by Lerah, W. A. Gray and L. A. Skinner, with Herbert Oliver H. E. Lander the third member of the crew, recently made a coast patrol flight from Langley Field, Va., to Lakeland, Fla., a distance of 268 miles, in the remarkable time of 3 hr., 30 min. or at an average speed of 74 m.p.h.

While Langley Field is not the Navy's South, several old weather vane and ice to make a rainy there, on during the period spent at Lakeland the crew of the TC-6 enjoyed the pleasure of participating in water sports, such as ice skating and ice hockey. After the makers and services stationed at Lakeland had worked for several hours during the snow early from the hangar, they were able to prepare the TC-6 for its return trip to Langley Field. The best 108 miles of the trip was made by moonlight.

Parachute Jump at Langley Field

Four military men of Langley Field recently made simultaneous parachute jumps from the military TC-9. These men, Captain Thayer and Redwood and Private Berwick and Austin, made the jumps from rope ladders suspended about twenty feet below the struts of the plane. The Pittsburgh Post

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RYAN AIRLINES — SAN DIEGO.

frame. The lens is 3 ft., 4 in. in length and 4 ft., 8 in. in width, and has a total length of approximately 20 in. The lens is contained in a solid metal, weather-proof casing, in which the electrical connections and the light-sensor support are also mounted. The casing is fitted with a sloping roof, which protects the ventilation outlet.

The illumination is furnished by a 12 kilowatt arc. The beam from this light illuminates an area approximately three-quarters of a mile in radius, at an intensity sufficient for night landing of planes. The light throws a fan-shaped glow and so appears like a star at an altitude of more than twenty feet.

Army Air Orders

Capt. Arthur E. Eitenhorst, Air Corps, Spokane, Wash., to Kelly Field.

First Lieut. Galah V. Hagman, Air Corps, Ormy Field, for long duty, to San Francisco. Upon completion of temporary duty, Lieut. Hagman will proceed to Spokane, Wash.

First Lieut. Orlan Maxwell Goodell, Air Corps, Reno, Grand Rapids, to active duty Bellfield Field, returning to reserve duty June 30.

Staff Serg. William M. Ross, Wright Field, and Tech. Roger Paul M. Jackson, Chanute Field and Alton, Illinois, to Kelly Field, to receive duty.

The resignation by First Lieut. Irvin Robert Anderson, Air Corps, of his commission, accepted.

First Lieut. Glen C. Hynobrow, Air Corps, Chanute Field, sent on leave to San Francisco, to report to command. Letterman (Hon. Resp. in observation and treatment).

George T. Barnes, Quartermaster Corps, Camp Norcross, detailed to the Air Corps, Brooks Field.

Capt. Walter F. Krasz, Air Corps, in addition to other duties, is designated as representative of Air Corps on the War Dept. tech. com.

1st Lieut. Robert L. G. Webb, Air Corps, released as representative of Air Corps War Dept. tech. com.

Sen. Louis Melvin J. Pavia, Air Corps, San Antonio, to active duty Kelly Field, returning to reserve status March 14.

First Lieut. Walter J. Bond, Air Corps, Kelly Field, to Washington.

Sen. Lieut. Henry Wendell Derr, Air Corps, San Antonio, to active duty Kelly Field, returning to reserve status June 30.

Sen. Lieut. Harry Porter Bond, Air Corps, San Antonio, to active duty Kelly Field, returning to reserve status June 30.

Orders 25, directing the retirement of First Serg. James H. Smith, Air Corps, are revoked.

First Lieut. Benjamin B. Canaday, Air Corps, Kelly Field, to Kelly Field.

First Serg. Robert H. Ardor, Air Corps, will be placed upon the retired list at Kansas Field.

Staff Serg. Lee L. Homan, Air Corps, France Field, transferred to the detached ordered men's list, effective at date of departure from present station, returned to the United States, and sent to Pittsburgh, reporting to command of 35th Div. Org. Regt. for assignment to duty with the Pittsburgh 35th Div.

Navy Air Orders

Lieut. Delmar S. Pulver, Det. VO Squad 2 (USS West Virginia) Am F. Squad, Battle Fleet, to Nav. Air Sta., Pearl Harbor, T. H.

Lieut. Edward B. Sullivan, Det. Regt. Six, Am F. Squad, to Nav. War Coll., Newport, R. I.

Ensign William W. Ellis to duty VO Squad 1, Am F. Squad, Battle Fleet (USS Colorado). Orders Am F. Squad 1.

Lieut. William Barker, Jr., to duty with VO Squad 2, Am F. Squad, Battle Fleet. Orders Am F. Squad 2.

Lieut. Frank R. Wittmayer, Det. VO Squad 1 (USS Colorado), Am F. Squad, Battle Fleet to USS Arizona. Orders Am F. Squad 1.

Ensign Edward F. Cross, Det. Nav. Air Sta., Pensacola, to USS Niagara.



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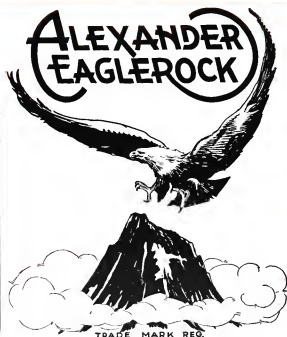
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 Southern Texas—M. P. "Dick" Blair, Box 420, San Antonio, Texas
 South Dakota—Rapid Airlines, Inc., Rapid City, S. D.
 N. M. & Co. Texas—Swastika Eaglerock Airways, 312 Columbia Ave., Albuquerque
 La.—Louisiana Airways, 1712 Pere Marquette Bldg., New Orleans
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 Fla. W. Coast—Wesley N. Raymond, Punta Gorda, Fla.
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 Utah, Nev. & So. Idaho—H. A. Sweet, Salt Lake City, Utah
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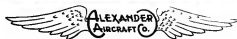
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